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UNITED STATES
DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

HANDBOOK
of
OFFICIAL
HAY STANDARDS
INCLUDING STRAW STANDARDS



REVISED EFFECTIVE APRIL 1, 1936

UNITED STATES
DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

HANDBOOK OF
OFFICIAL HAY STANDARDS

Official Hay and Straw Standards of the
United States as established and promulgated by
the Secretary of Agriculture

Important features of United States Hay
and Straw Standards

Important features of Federal Hay
and Straw Inspection

REVISED EFFECTIVE APRIL 1, 1936



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1936

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UNITED STATES DEPARTMENT
OF AGRICULTURE,
Washington, D. C.

By virtue of the authority vested in the Secretary of Agriculture by the provision in the act of Congress entitled "An Act Making Appropriations for the Department of Agriculture and for the Farm Credit Administration for the fiscal year ending June 30, 1936, and for other purposes", approved May 17, 1935 (49 Stat. 247), I, H. A. Wallace, Secretary of Agriculture, do hereby fix, establish, and promulgate in lieu of all existing standards for hay and straw the following standards of quality and condition for Alfalfa and Alfalfa Mixed Hay; Timothy and Clover Hay; Prairie Hay; Johnson and Johnson Mixed Hay; Grain, Wild Oat, Vetch, and Grain Mixed Hay; Lespedeza and Lespedeza Mixed Hay; Soybean and Soybean Mixed Hay; Grass Hay; Mixed Hay; and Straw, which shall be in force and effect on and after April 1, 1936, and so long as Congress shall provide the necessary authority therefor, unless amended or superseded by standards hereafter prescribed and promulgated under such authority.

In testimony whereof I have hereunto set my hand and caused the official seal of the Department of Agriculture to be affixed in the City of Washington this 11th day of January 1936.



Hawallace
Secretary.

STANDARDS FOR HAY ¹

Definitions

For the purposes of the official hay standards of the United States:

Hay shall be the harvested, unthreshed herbage of those kinds of forage plants which have recognized feed value as determined by the Bureau of Agricultural Economics, United States Department of Agriculture; which herbage meets the requirements of the various classes in groups I to IX, inclusive, is not coarse and woody, and does not contain more than 35 percent of foreign material.

Groups.—Hay for which there are standards shall be divided into nine groups as follows: group I, Alfalfa and Alfalfa Mixed Hay; group II, Timothy and Clover Hay; group III, Prairie Hay; group IV, Johnson and Johnson Mixed Hay; group V, Grain, Wild Oat, Vetch, and Grain Mixed Hay; group VI, Lespedeza and Lespedeza Mixed Hay; group VII, Soybean and Soybean Mixed Hay; group VIII, Grass Hay; and group IX, Mixed Hay.

Classes.—Each group of hay includes one or more classes which are based on the kind of hay or mixture of various kinds and have no reference whatever to quality or condition.

Grades.—Each class of hay is graded according to the grade requirements of the three numerical grades and Sample grade of the group under which it falls and according to the special grades which are applicable.

The following definitions are applicable to all groups of hay and the terms used in the class and grade requirements are interpreted according to these definitions.

Alfalfa may include not to exceed 10 percent (of the total hay) of clover, vetch, and/or other

¹ The specifications of these standards shall not excuse failure to comply with the provisions of the Food and Drugs Act.

forage legumes, except that alfalfa shall not have a percentage allowance of clover in the class Alfalfa Clover Mixed.

Timothy may include not to exceed 10 percent (of the total hay) of other grasses, except in the classes Timothy Light Grass Mixed and Timothy Heavy Grass Mixed.

Clover shall be red clover, alsike clover, and/or white clover and may include not to exceed 10 percent (of the total hay) of alfalfa, vetch, and/or other forage legumes, except that clover shall not have a percentage allowance of alfalfa in the class Alfalfa Clover Mixed.

Upland grasses shall be bluestems (*Andropogon* spp.), grama grasses (*Bouteloua* spp.), paspalum (*Paspalum* spp.), wheatgrasses (*Agropyron* spp.), prairie junegrass (*Koeleria cristata*), Indian grass (*Sorghastrum nutans*), and/or other upland grasses² which grow commonly in virgin upland prairie meadows. Upland grasses may include not to exceed 10 percent (of the total hay) of midland grasses and/or other grasses, except that upland grasses shall not have a percentage allowance of midland grasses in the classes Midland Prairie and Upland-Midland Prairie Mixed.

Midland grasses shall be slough grass or prairie cordgrass (*Spartina pectinata*), bluejoint (*Calamagrostis* spp.), and/or sprangletop (*Fluminea festucacea*).

Grasses unless otherwise specifically provided for shall include (a) redtop, orchard grass, Kentucky bluegrass, Canada bluegrass, crabgrass, smooth brome grass, ryegrass, barnyard grass, quackgrass, paspalum, Bermuda grass, and wheatgrasses; (b) the following grasses if early cut, wild-rye, annual brome grasses such as cheat, pigeon grass (sometimes called foxtail or wild

² Explanatory note.—Questions relating to, or samples of the kinds of grasses that may be included in upland grasses should be submitted to the Bureau of Agricultural Economics United States Department of Agriculture, for determination or interpretation.

millet), and broomsedge; (c) such other cultivated and wild grasses, sedges, and rushes as occur in hay meadows; and (d) not to exceed 10 percent (of the total hay) of timothy, Johnson grass, and/or grain hay.

Johnson grass may include not to exceed 10 percent (of the total hay) of other grasses and 10 percent (of the total hay) of early-cut cane hay, except that Johnson grass shall not have a percentage allowance of other grasses in the classes Johnson Light Grass Mixed and Johnson Heavy Grass Mixed.

Oat hay shall be hay of all varieties of tame oats which does not meet the requirements for red oat hay, and may include not to exceed 10 percent (of the total hay) of wheat hay and/or wild oat hay, and not to exceed 5 percent of barley hay and/or grasses.

Red oat hay may include not to exceed 10 percent (of the total hay) of other varieties of tame oat hay, wheat hay, and/or wild oat hay, and not to exceed 5 percent of barley hay and/or grasses.

Wheat hay may include not to exceed 10 percent (of the total hay) of oat hay and/or wild oat hay, and not to exceed 5 percent of barley hay and/or grasses.

Wild oat hay may include not to exceed 10 percent (of the total hay) of grasses.

Barley hay may include not to exceed 10 percent (of the total hay) of other grain hay and not to exceed 5 percent of grasses.

Grain hay shall be hay of the grains oats, barley, wheat, rye, and/or wild oats.

Vetch may include not to exceed 10 percent (of the total hay) of alfalfa, clover and/or other forage legumes.

Lespedeza may include not to exceed 10 percent (of the total hay) of alfalfa, clover, vetch, and/or other forage legumes.

Soybean hay may include not to exceed 10 percent (of the total hay) of cowpeas, lespedeza,

yellow trefoil (black medic), vetch, clover, and/or other forage legumes.

Legumes shall be alfalfa, lespedeza, yellow trefoil (black medic), vetch, clover, and/or other plants of the pea family suitable for forage.

Foreign material shall be (a) weeds, three-awn or wire grasses (*Aristida* spp.), tickle grass (*Agrostis hiemalis*), and lovegrasses (*Eragrostis* spp.); (b) the following grasses if mature, wild-rye, annual brome-grasses such as cheat, pigeon grass (sometimes called foxtail or wild millet), broomsedge, and needlegrasses (*Stipa* spp.) from which the needles have fallen; (c) such sedges, rushes, and other plants as are coarse and woody or otherwise not suitable for feeding purposes; (d) overripe grain hay, cornstalks, grain straw, stubble, and chaff; and (e) other objectionable matter which occurs naturally in hay.

Injurious foreign material shall be sandburs, poisonous plants, harsh bearded grasses such as mature foxtail barley or squirreltail grass (*Hordeum jubatum*), mature ripgut or broncho grass (*Bromus rigidus*), grasses having a sharp pointed callus at the base of the seed such as matured needlegrasses (*Stipa* spp.) with the needles attached, mature prairie three-awn grass (*Aristida oligantha*), and/or other matter which is injurious when fed to livestock.

Filled grain shall be the kernels of wheat, oats, barley, rye, or wild oats which have reached the late dough stage and which may shrivel somewhat in drying.

Green color.—The term “percent green” employed in these standards represents the amount of green color (green appearance) in field-cured hay computed as a percentage of the 100 percent green color of hay produced so as to have received no discoloration from maturity, sun bleach, dew, rain, or other damage.

Note.—Field-cured hay which on casual examination appears to be of uniform green color, nearly always contains slight discolorations which materially lower the amount of green

color from the perfect color standard. Thus the standard for the No. 1 grade in the various groups of hay represents an amount of color that is relatively high for field-cured hay.

Percentages of mixtures and foreign material shall be based upon percentages by weight of the total hay. Percentages of leaves or leafiness of alfalfa, clover (including blossoms), lespedeza, or soybean hay (including seed pods not badly shattered or in condition to shatter) shall be based upon percentages by weight, respectively, of the total alfalfa, clover, lespedeza, or soybean hay present. Determinations of coarse and/or fine hay in the alfalfa, Johnson, grain, and soybean hay standards shall be based upon percentages by count of stalks measured 2 inches from the cut end, respectively, of the alfalfa, Johnson grass, oat, and soybean stalks present in the hay. Percentages of color shall be based upon color determinations ascertained by the method prescribed by the Bureau of Agricultural Economics, United States Department of Agriculture, which determinations shall be expressed in popular terms as "percent green" in the alfalfa, timothy and clover, prairie, Johnson, soybean, and grass hay standards and in descriptive terms in the grain and lespedeza hay standards.

Alfalfa and Alfalfa Mixed Hay

(Group I)

Class requirements

Class	Mixture percentages
Alfalfa.....	Alfalfa with not over 5 percent grasses.
Alfalfa Light Grass Mixed.	A mixture of alfalfa and grasses with over 5 percent but not over 20 percent grasses.
Alfalfa Heavy Grass Mixed.	A mixture of alfalfa and grasses with over 20 percent but not over 60 percent grasses.
Alfalfa Light Timothy Mixed.	A mixture of alfalfa and timothy with over 5 percent but not over 30 percent timothy.
Alfalfa Heavy Timothy Mixed.	A mixture of alfalfa and timothy with over 30 percent alfalfa and over 30 percent timothy.
Alfalfa Clover Mixed..	A mixture of alfalfa and clover with over 10 percent but not over 50 percent clover and not over 10 percent grasses.
Alfalfa Light Johnson Mixed.	A mixture of alfalfa and Johnson grass with over 5 percent but not over 30 percent Johnson grass.
Alfalfa Heavy Johnson Mixed.	A mixture of alfalfa and Johnson grass with over 30 percent alfalfa and over 30 percent Johnson grass.
Alfalfa Light Grain Mixed.	A mixture of alfalfa and grain hay with over 5 percent but not over 20 percent grain hay and not over 10 percent grasses.
Alfalfa Heavy Grain Mixed.	A mixture of alfalfa and grain hay with over 40 percent alfalfa and over 20 percent grain hay and not over 10 percent grasses.

Grade requirements¹ for the classes of Alfalfa, Alfalfa Light Grass Mixed, Alfalfa Light Timothy Mixed, Alfalfa Clover Mixed, Alfalfa Light Johnson Mixed, and Alfalfa Light Grain Mixed

U. S. grade No.	Leafiness of alfalfa (percent leaves)	Percent green color	Maximum percent foreign material
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ²	Less than 35 ²	15
Sample grade.	Hay which contains more than 15 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, caked, badly broken, badly weathered, badly frosted, badly overripe, or very dusty; or which is otherwise of distinctly low quality.		

¹ Hay in which a majority of the alfalfa stalks bear brown and/or black seed pods shall not be graded No. 1 or be assigned any special grade except Coarse.

² Does not apply to hay graded No. 3 on account of any other factor.

Grade requirements¹ for the classes of Alfalfa Heavy Grass Mixed, Alfalfa Heavy Timothy Mixed, Alfalfa Heavy Johnson Mixed, and Alfalfa Heavy Grain Mixed

U. S. grade No.	Percent green color	Maximum percent foreign material
1.....	60 or more.....	5
2.....	35 or more.....	10
3.....	Less than 35 ²	15
Sample grade.	Hay which contains more than 15 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, caked, badly broken, badly weathered, badly frosted, badly overripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ Hay in which a majority of the alfalfa stalks bear brown and/or black seed pods shall be not graded No. 1 or be assigned any special grade except Coarse.

² Does not apply to hay graded No. 3 on account of foreign material.

Special Grades

Grades for extra leafy hay.—Hay of any grade of the classes in group I, in which leafiness is a grading factor (Alfalfa, Alfalfa Light Grass Mixed, Alfalfa Light Timothy Mixed, Alfalfa Clover Mixed, Alfalfa Light Johnson Mixed, and Alfalfa Light Grain Mixed) and in which the leafiness of the alfalfa is 50 percent or more, with most of the leaves clinging, shall have the words "Extra Leafy" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Leafy Alfalfa", "U. S. No. 3 Extra Leafy Alfalfa Light Grass Mixed", "U. S. Sample grade Extra Leafy Alfalfa."

Grades for leafy hay.—Hay of the grades 2, 3, and Sample grade of the classes in group I, in which leafiness is a grading factor (Alfalfa, Alfalfa Light Grass Mixed, Alfalfa Light Timothy Mixed, Alfalfa Clover Mixed, Alfalfa Light Johnson Mixed, and Alfalfa Light Grain Mixed) and in which the leafiness of the alfalfa is 40 percent or more, shall have the word “Leafy” included in and made a part of the grade designation, as: “U. S. No. 2 Leafy Alfalfa”, “U. S. No. 2 Leafy Extra Green Alfalfa”, “U. S. No. 3 Leafy Green Alfalfa”, “U. S. Sample grade Leafy Alfalfa.”

Grades for extra green hay.—Hay of any grade of any of the classes in group I, which has 75 percent or more green color, shall have the words “Extra Green” included in and made a part of the grade designation, as: “U. S. No. 1 Extra Green Alfalfa”, “U. S. No. 3 Extra Green Alfalfa.”

Grades for green hay.—Hay of the grades 2, 3, and Sample grade of any of the classes in group I, which has 60 percent or more green color, shall have the word “Green” included in and made a part of the grade designation, as: “U. S. No. 2 Green Alfalfa”, “U. S. No. 2 Green Extra Leafy Alfalfa”, “U. S. Sample grade Green Alfalfa.”

Grades for coarse hay.—Hay of any grade of any of the classes in group I, in which the alfalfa stalks are hard and round, and more than 30 percent of the alfalfa stalks have diameters equal to and greater than the diameter of no. 11 steel wire (approximately twelve one-hundredths of an inch) by steel wire gage standards, shall have the word “Coarse” included in and made a part of the grade designation, as: “U. S. No. 2 Coarse Alfalfa”, “U. S. Sample grade Coarse Alfalfa.”

Timothy and Clover Hay

(Group II)

Class requirements

Class	Mixture percentages
Timothy-----	Timothy with not over 10 percent legumes.
Timothy Light Clover Mixed.	A mixture of timothy and clover with over 10 percent but not over 30 percent clover.
Timothy Medium Clover Mixed.	A mixture of timothy and clover with over 30 percent but not over 50 percent clover.
Timothy Light Grass Mixed.	A mixture of timothy and other grasses with over 10 percent but not over 30 percent other grasses and not over 10 percent legumes.
Timothy Heavy Grass Mixed.	A mixture of timothy and other grasses with over 30 percent but not over 60 percent other grasses and not over 10 percent legumes.
Timothy Light Alfalfa Mixed.	A mixture of timothy and alfalfa with over 10 percent but not over 30 percent alfalfa.
Clover-----	Clover with not over 20 percent timothy, other grasses, and/or grain hay.
Clover Light Timothy Mixed.	A mixture of clover and timothy with over 50 percent clover and over 20 percent timothy.

Special Grades

Grades for extra green hay.—Hay of any grade of any of the classes in group II, which has 60 percent or more green color, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Timothy", "U. S. No. 3 Extra Green Clover Light Timothy Mixed", "U. S. Sample grade Extra Green Clover."

(continued on p. 15)

Grade requirements ¹ for all classes of Timothy and Clover Hay

U. S. grade No.	Percent green color	Maximum percent foreign material
1.....	45 or more.....	10
2.....	30 or more.....	15
3.....	Less than 30 ²	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is under-cured, heating, hot, wet, musty, moldy, caked, badly broken, badly stained, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ Hay that is stained shall not be graded Extra Green, Green, No. 1, or No. 2.

² Does not apply to hay that is graded No. 3 on account of foreign material.

Special Grades (continued from p. 14)

Grades for green hay.—Hay of the grades 2, 3, and Sample grade of any of the classes in group II, which has 45 percent or more green color, shall have the word “Green” included in and made a part of the grade designation, as: “U. S. No. 2 Green Timothy”, “U. S. Sample grade Green Clover Light Timothy Mixed.”

Grades for stemmy hay.—Hay of any grade of the classes Clover and Clover Light Timothy Mixed in group II, in which the leaves and blossoms of the clover constitute less than 20 percent of the total weight of the clover, shall have the word “Stemmy” included in and made a part of the grade designation, as: “U. S. No. 2 Stemmy Clover”, “U. S. Sample grade Stemmy Clover Light Timothy Mixed.”

Prairie Hay

(Group III)

Class requirements

Class	Mixture percentages
Upland Prairie.....	Upland grasses with not over 10 per cent legumes.
Midland Prairie.....	Midland grasses or a mixture of midland grasses with upland, timothy, and/or other grasses, with over 40 per cent midland grasses and not over 10 percent legumes.
Upland-Midland Prairie Mixed.	A mixture of upland and midland grasses with over 10 percent but not over 40 percent midland grasses and not over 10 percent legumes.

Grade requirements ¹ for all classes of Prairie Hay

U. S. Grade No.	Percent green color	Maximum percent foreign material
1.....	50 or more.....	10
2.....	35 or more.....	15
3.....	Less than 35 ²	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is under-cured, heating, hot, wet, musty, moldy, caked, badly broken, badly stained, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ (a) Hay that is stained shall not be graded Extra Green, Green, No. 1, or No. 2;

(b) Hay of the class Upland Prairie in which one-third or more of the upland grass stalks bear seed heads and/or jointed stems, shall be graded one grade lower than it would be graded on the factor of color.

² Does not apply to hay graded No. 3 on account of foreign material.

Special Grades

Grades for extra green hay.—Hay of any grade of any of the classes in group III, which has 65 percent or more green color, shall have the words “Extra Green” included in and made a part of the grade designation, as: “U. S. No. 1 Extra Green Upland Prairie”, “U. S. No. 3 Extra Green Midland Prairie.”

Grades for green hay.—Hay of the grades 2, 3, and Sample grade of any of the classes in group III, which has 50 percent or more green color, shall have the word “Green” included in and made a part of the grade designation, as: “U. S. No. 2 Green Upland Prairie.”

Johnson and Johnson Mixed Hay**(Group IV)****Class requirements**

Class	Mixture percentages
Johnson.....	Johnson grass with not over 10 percent legumes.
Johnson Light Grass Mixed.	A mixture of Johnson grass and other grasses with over 10 percent but not over 30 percent other grasses and not over 10 percent legumes.
Johnson Heavy Grass Mixed.	A mixture of Johnson grass and other grasses with over 30 percent but not over 60 percent other grasses and not over 10 percent legumes.
Johnson Light Alfalfa Mixed.	A mixture of Johnson grass and alfalfa with over 10 percent but not over 30 percent alfalfa.
Johnson Light Lespedeza Mixed.	A mixture of Johnson grass and lespedeza with over 10 percent but not over 30 percent lespedeza.

Special Grades

Grades for extra green hay.—Hay of any grade of any of the classes in group IV, which has 55 percent or more green color, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Johnson", "U. S. No. 3 Extra Green Johnson Light Grass Mixed."

Grades for green hay.—Hay of the grades 2, 3, and Sample grade of any of the classes in group IV, which has 40 percent or more green color, shall have the word "Green" included in and made a part of the grade designation, as: "U. S. No. 3 Green Johnson."

Grades for fine hay.—Hay of any grade of the class Johnson in group IV, which has 70 percent or more of the Johnson grass stalks with diame-

(continued on p. 19)

Grade requirements for all classes of Johnson and Johnson Mixed Hay

U. S. grade No.	Percent green color	Maximum percent foreign material
1.....	40 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ¹	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is under-cured, heating, hot, wet, musty, moldy, caked, badly broken, badly stained, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ Does not apply to hay that is graded No. 3 on account of foreign material.

Special Grades (continued from p. 18)

ters equal to and smaller than the diameter of no. 13 steel wire (approximately nine one-hundredths of an inch), and no stalks having diameters equal to, or greater than, the diameter of no. 10 steel wire (approximately thirteen one-hundredths of an inch) by steel wire gage standards, shall have the word "Fine" included in and made a part of the grade designation, as: "U. S. No. 1 Fine Johnson", "U. S. Sample grade Fine Johnson."

Grades for coarse hay.—Hay of any grade of any of the classes in group IV, in which more than 30 percent of the Johnson grass stalks have diameters equal to and greater than the diameter of no. 9 steel wire (approximately fifteen one-hundredths of an inch) by steel wire gage standards, shall have the word "Coarse" included in and made a part of the grade designation, as: "U. S. No. 2 Coarse Johnson", "U. S. Sample grade Coarse Johnson."

Grain, Wild Oat, Vetch, and Grain Mixed Hay (Group V)

Class requirements

Class	Mixture percentages
Oat Hay.....	Oat hay with not over 10 percent legumes.
Red Oat Hay.....	Red oat hay with not over 10 percent legumes.
Wheat Hay.....	Wheat hay with not over 10 percent legumes.
Barley Hay.....	Barley hay with not over 10 percent legumes.
Wild Oat Hay.....	Wild oat hay with not over 30 percent other grain hay and not over 10 percent legumes.
Red Oat and Wild Oat Mixed. Wheat and Wild Oat Mixed.	A mixture of red oat hay and wild oat hay, or wheat hay and wild oat hay, with over 10 percent but not over 40 percent wild oat hay and not over 10 percent legumes in each case.
Wild Oat and Grain Mixed.	A mixture of wild oat hay and other grain hay with over 40 percent wild oat hay and over 30 percent other grain hay and not over 10 percent legumes.
Oat Light Alfalfa Mixed. Wheat Light Alfalfa Mixed. Barley Light Alfalfa Mixed.	A mixture of oat hay (including red oat hay) and alfalfa, wheat hay and alfalfa, or barley hay and alfalfa, with over 10 percent but not over 40 percent alfalfa and not over 10 percent grasses including the 5 percent allowance in oat hay, wheat hay, or barley hay in each case.

Grain, Wild Oat, Vetch, and Grain Mixed Hay

(Group V)

Class requirements—continued

Class	Mixture percentages
Oat Light Vetch Mixed. Wheat Light Vetch Mixed.	A mixture of oat hay (including red oat hay) and vetch hay, or wheat hay and vetch hay, with over 10 percent but not over 40 percent vetch and not over 10 percent grasses including the 5 percent allowance in oat hay or wheat hay in each case.
Oat and Vetch Mixed. Wheat and Vetch Mixed.	A mixture of oat hay (including red oat hay) and vetch hay, or wheat hay and vetch hay, with over 40 percent but not over 75 percent vetch and not over 10 percent grasses including the 5 percent allowance in oat hay or wheat hay in each case.
Vetch Hay-----	Vetch hay with over 75 percent vetch.

Grade requirements for the classes of Oat Hay, Red Oat Hay, Barley Hay,¹ Red Oat and Wild Oat Mixed, Oat Light Alfalfa Mixed, and Barley Light Alfalfa Mixed¹

U. S. grade No.	Maturity	Color	Maximum percent foreign material
1-----	The grain shall have been cut in the dough stage and shall contain half-formed kernels and "filled" grain, with little or no shattering of kernels.	Bright, natural green to yellowish green or bright, reddish purple.	5
2-----	The grain shall have been cut in the dough stage or before and may contain half-formed kernels and "filled" grain, with little or no shattering of kernels.	Yellowish green or reddish purple to yellow with traces of green or reddish yellow. May be slightly discolored or slightly weathered.	10
3-----	May be fully matured.	Yellow. May be discolored, weathered or stained.	15
Sample grade.	Hay of the above classes which contains more than 15 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, sour, caked, badly broken, badly stained, badly weathered, badly over-ripe, or very dusty; or otherwise of distinctly low quality.		

¹ Barley hay to meet the requirements of grade No. 1 shall have been cut in the early dough stage or before, and may contain half-formed kernels and a little "filled" grain.

Grade requirements for the classes of Wheat Hay, Wild Oat Hay, Wheat and Wild Oat Mixed, Wild Oat and Grain Mixed, and Wheat Light Alfalfa Mixed

U. S. grade No.	Maturity	Color	Maximum percent foreign material
1-----	The grain shall have been cut in the milk stage or before and may contain small, shriveled kernels and a little "filled" grain.	Bright, natural green to yellowish green.	5
2-----	The grain shall have been cut in the early dough stage or before and may contain half-formed kernels and some "filled" grain, although such "filled" grain shall not predominate.	Yellowish green to yellow with traces of green. May be slightly discolored or slightly weathered.	10
3-----	May be fully matured.	Yellow or greenish yellow with many brown leaves. May be stained or weathered.	15
Sample grade.	Hay of the above classes which contains more than 15 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, sour, caked, badly broken, badly stained, badly weathered, badly over-ripe, or very dusty; or otherwise of distinctly low quality.		

Grade requirements for the classes of Oat Light Vetch Mixed, Wheat Light Vetch Mixed, Oat and Vetch Mixed, Wheat and Vetch Mixed, and Vetch Hay

U. S. grade No.	Maturity	Color	Maximum percent foreign material
1-----	The vetch shall have been cut when the pods on the lower $\frac{1}{3}$ of the plant are one-half filled or before. The grain shall have been cut in the early dough stage or before and may contain half-formed kernels and a little "filled" grain.	Bright, natural green to greenish yellow.	5
2-----	The vetch shall have been cut when the pods on the lower $\frac{2}{3}$ of the plant are one-half filled or before. The grain shall have been cut in the dough stage or before and may contain some "filled" grain, although such "filled" grain shall not predominate.	Greenish yellow to brownish yellow. May be slightly discolored or slightly weathered.	10
3-----	May be fully matured.	Yellowish brown or brown. May be stained or weathered.	15
Sample grade.	Hay of the above classes which contains more than 15 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, sour, caked, badly broken, badly stained, badly weathered, badly overripe, or very dusty; or otherwise of distinctly low quality.		

Special Grades

Grades for Coarse Hay.—Hay of any grade of the classes Oat Hay, Red Oat Hay, and Red Oat and Wild Oat Mixed in group V, in which more than 30 percent of the oat stalks have diameters equal to and greater than the diameter of no. 6 steel wire (approximately nineteen one-hundredths of an inch) by steel wire gage standards, shall have the word “Coarse” included in and made a part of the grade designation, as: “U. S. No. 2 Coarse Oat Hay.”

Lespedeza and Lespedeza Mixed Hay**(Group VI)****Class requirements**

Class	Mixture percentages
Lespedeza.....	Lespedeza with not over 10 percent grasses.
Lespedeza Light Grass Mixed.	A mixture of lespedeza and grasses with over 10 percent but not over 30 percent grasses.
Lespedeza Heavy Grass Mixed.	A mixture of lespedeza and grasses with over 30 percent but not over 60 percent grasses.
Lespedeza Light Johnson Mixed.	A mixture of lespedeza and Johnson grass with over 10 percent but not over 30 percent Johnson grass.
Lespedeza Heavy Johnson Mixed.	A mixture of lespedeza and Johnson grass with over 30 percent lespedeza and over 30 percent Johnson grass.

Grade requirements for the classes of Lespedeza, Lespedeza Light Grass Mixed, and Lespedeza Light Johnson Mixed

U. S. grade No.	Leafiness of lespedeza (percent leaves)	Color	Maximum percent foreign material
1-----	45 or more....	Green to greenish brown....	10
2-----	30 or more....	Greenish brown to brown....	15
3-----	Less than 30 ¹	Brown ¹ -----	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, caked, badly broken, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.		

¹ Does not apply to hay graded No. 3 on account of any other factor.

Special Grades

Grades for extra leafy hay.—Hay of any grade of the classes in group VI, in which leafiness is a grading factor (Lespedeza, Lespedeza Light Grass Mixed, and Lespedeza Light Johnson Mixed) and in which the leafiness of the lespedeza is 55 percent or more, with most of the leaves clinging, shall have the words “Extra Leafy” included in and made a part of the grade designation, as: “U. S. No. 1 Extra Leafy Lespedeza”, “U. S. No. 3 Extra Leafy Lespedeza Light Grass Mixed”, “U. S. Sample grade Extra Leafy Lespedeza.”

Grades for leafy hay.—Hay of the grades 2, 3, and Sample grade of the classes in group VI, in which leafiness is a grading factor (Lespedeza, Lespedeza Light Grass Mixed, and Lespedeza Light Johnson Mixed) and in which the leafiness

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Grade requirements for the classes of Lespedeza Heavy Grass Mixed and Lespedeza Heavy Johnson Mixed

U. S. grade No.	Color	Maximum percent foreign material
1.....	Green to greenish brown.....	10
2.....	Greenish brown to brown.....	15
3.....	Brown ¹	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is under-cured, heating, hot, wet, musty, moldy, caked, badly broken, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ Does not apply to hay graded No. 3 on account of foreign material.

Special Grades (continued from p. 27)

of the lespedeza is 45 percent or more, shall have the word "Leafy" included in and made a part of the grade designation, as: "U. S. No. 2 Leafy Lespedeza", "U. S. Sample grade Leafy Lespedeza."

Grades for extra green hay.—Hay of any grade of any of the classes in group VI, which is natural green in color, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Lespedeza."

Grades for green hay.—Hay of the grades 2, 3, and Sample grade of any of the classes in group VI, which is green to greenish brown, shall have the word "Green" included in and made a part of the grade designation, as: "U. S. No. 2 Green Lespedeza."

Soybean and Soybean Mixed Hay

(Group VII)

Class requirements

Class	Mixture percentages
Soybean Hay-----	Soybean hay with not over 10 percent Johnson grass or 15 percent other grasses.
Soybean Light Grass Mixed.	A mixture of soybean hay and grasses with over 15 percent but not over 30 percent grasses.
Soybean Heavy Grass Mixed.	A mixture of soybean hay and grasses with over 30 percent but not over 60 percent grasses.
Soybean Light Johnson Mixed.	A mixture of soybean hay and Johnson grass with over 10 percent but not over 30 percent Johnson grass.
Soybean Heavy Johnson Mixed.	A mixture of soybean hay and Johnson grass with over 30 percent but not over 60 percent Johnson grass.

Grade requirements for the classes of Soybean Hay, Soybean Light Grass Mixed, and Soybean Light Johnson Mixed

U. S. grade No.	Leafiness of soybean hay (percent leaves)	Percent green color	Maximum percent foreign material
1.....	40 or more.....	40 or more.....	10
2.....	25 or more.....	25 or more.....	15
3.....	Less than 25 ¹	Less than 25 ¹	20
Sample grade.	Hay which contains more than 20 per cent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is undercured, heating, hot, wet, musty, moldy, caked, badly broken, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.		

¹ Does not apply to hay graded No. 3 on account of any other factor.

Special Grades

Grades for extra green hay.—Hay of any grade of any of the classes in group VII, which has 55 percent or more green color, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Soybean Hay."

Grades for green hay.—Hay of the grades 2, 3, and Sample grade of any of the classes in group VII, which has 40 percent or more green color, shall have the word "Green" included in and made a part of the grade designation, as: "U. S. No. 2 Green Soybean Hay."

Grades for leafy hay.—Hay of the grades 2, 3, and Sample grade of the classes in group VII, in which leafiness is a grading factor (Soybean Hay, Soybean Light Grass Mixed, and Soybean

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Grade requirements for the classes of Soybean Heavy Grass Mixed and Soybean Heavy Johnson Mixed

U. S. grade No.	Percent green color	Maximum percent foreign material
1.....	40 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ¹	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is under-cured, heating, hot, wet, musty, moldy, caked, badly broken, badly weathered, badly over-ripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ Does not apply to hay graded No. 3 on account of foreign material.

Special Grades (continued from p. 30)

Light Johnson Mixed) and in which the leafiness of the soybean hay is 40 percent or more, shall have the word "Leafy" included in and made a part of the grade designation, as: "U. S. No. 2 Leafy Soybean Hay", "U. S. No. 3 Leafy Soybean Light Grass Mixed."

Grades for coarse hay.—Hay of any grade of any of the classes in group VII, in which more than 30 percent of the soybean stalks have diameters equal to and greater than the diameter of no. 4 steel wire (approximately twenty-three one-hundredths of an inch) by steel wire gage standards, shall have the word "Coarse" included in and made a part of the grade designation, as: "U. S. No. 2 Coarse Soybean Hay."

Grass Hay

(Group VIII)

The group Grass Hay has one class, namely, Grass Hay which shall be hay containing more than 60 percent of those grasses, sedges, and/or rushes other than timothy, Johnson grass, upland and midland grasses, grain cut for hay, millet, and/or Sudan grass.

Explanatory note.—Questions relating to, or samples of, the kinds of grasses, sedges, and/or rushes that may be included in the class Grass Hay should be submitted to the Bureau of Agricultural Economics, United States Department of Agriculture, for determination or interpretation.

Grade requirements for Grass Hay ¹

U. S. grade No.	Percent green color	Maximum percent foreign material
1.....	50 or more.....	10
2.....	35 or more.....	15
3.....	Less than 35 ²	20
Sample grade.	Hay which contains more than 20 percent of foreign material; or which contains more than a trace of injurious foreign material; or which has any objectionable odor; or which is under-cured, heating, hot, wet, musty, moldy, caked, badly broken, badly stained, badly weathered, badly overripe, or very dusty; or which is otherwise of distinctly low quality.	

¹ Hay that is stained shall not be graded Extra Green, Green, No. 1, or No. 2.

² Does not apply to hay graded No. 3 on account of foreign material.

Grade designations for Grass Hay shall include after the words "Grass Hay" either (1) such local trade names as will identify the kind of grasses, sedges, and/or rushes, or (2) the common name of the various kinds of grasses, sedges, rushes, and legumes which constitute more than 10 percent of the mixture written in the order of importance. Grasses which cannot be identified can be described by the term "miscellaneous grasses."

Special grades

Grades for extra green hay.—Grass Hay of any grade, which has 65 percent or more green color, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Grass Hay, Colorado South Park", "U. S. No. 3 Extra Green Grass Hay, Redtop and Bluegrass."

Grades for green hay.—Grass Hay of the grades 2, 3, and Sample grade, which has 50 percent or more green color, shall have the word "Green" included in and made a part of the grade designation, as: "U. S. No. 2 Green Grass Hay, Redtop."

Mixed Hay

(Group IX)

The group Mixed Hay has one class, namely, Mixed Hay which shall be any mixture of hay not classified in the groups I to VIII, inclusive, but which contains 50 percent or more singly or in combination of alfalfa, timothy, clover, upland grasses, midland grasses, Johnson grass, grain hay, wild oat hay, vetch hay, lespedeza, soybean hay, and grasses as defined in the United States standards for hay.

Grades for Mixed Hay.—Mixed Hay shall be graded according to the grade requirements and definitions for the kind of hay which predominates in the mixture, except that all numerical and special grade specifications pertaining to leafiness, stemminess, coarseness, and fineness shall be disregarded.

The grade designation for Mixed Hay shall include successively, in the order named, (1) the letters "U. S."; (2) the number of the grade or the words "Sample grade", as the case may be, and any special grade that may apply; (3) the words "Mixed Hay"; and (4) the name and approximate percentage of each kind of hay which constitutes more than 10 percent of the mixture written in the order of importance.

STANDARDS FOR STRAW

(Wheat, Oat, Barley, Rye, and Rice Straw)

Definitions

For the purposes of the United States standards for Wheat, Oat, Barley, Rye, and Rice Straw:

Straw shall be the remnants of wheat, oat, barley, rye, and rice crops from which the grain has been threshed, and may include not to exceed 10 percent (of the total straw) of grasses that are not coarse and woody.

Chaff shall be shattered glumes, also all pieces of straw not over 4 inches in length.

Foreign material shall be all matter other than straw except grasses that are not coarse and woody.

Color.—The color specifications “bright” and “weathered or stained”, shall be interpreted according to the color determinations ascertained by the method prescribed by the Bureau of Agricultural Economics, United States Department of Agriculture.

Percentages of chaff and foreign material shall be based upon percentages by weight of the total straw.

Grade requirements for Straw

U. S. Grade No.	Color	Maximum percent chaff ¹
1.....	Bright.....	35
2.....	Weathered or stained.....	35
Sample grade.	Straw which contains more than 10 percent of foreign material; or more than 75 percent of chaff; or which is heating, hot, wet, musty, moldy, caked, badly stained, badly weathered, or very dusty; or which is otherwise of distinctly low quality.	

¹ The special grades for “chaffy straw” apply to straw of any numerical grade or to Sample grade containing more than 35 percent chaff.

Grade designations for straw shall include successively in the order named, (1) the letters "U. S."; (2) the number of the grade or the words "Sample grade", as the case may be, and any special grade that may apply; and (3) the words "Wheat Straw, Oat Straw, Barley Straw, Rye Straw, or Rice Straw", as the case may be.

Special Grades

Grades for straight rye straw.—Rye Straw of any grade, which is straight and untangled from threshing and which has been pressed into large box-pressed bales, shall have the word "Straight" included in and made a part of the grade designation, as: "U. S. No. 1 Straight Rye Straw", "U. S. Sample grade Straight Rye Straw."

Grades for long rye straw.—Rye Straw of any grade, which is straight and untangled from threshing and which has been pressed into perpetual-pressed bales, shall have the word "Long" included in and made a part of the grade designation, as: "U. S. No. 1 Long Rye Straw."

Grades for chaffy straw.—Wheat Straw, Oat Straw, Barley Straw, Rye Straw, or Rice Straw of any grade, which contains more than 35 per cent chaff, shall have the word "Chaffy" included in and made a part of the grade designation, as: "U. S. No. 1 Chaffy Oat Straw", "U. S. Sample grade Chaffy Barley Straw", "U. S. Sample grade Chaffy Wheat Straw."

IMPORTANT FEATURES OF OFFICIAL HAY STANDARDS

Hay Groups

Official United States hay standards comprise standards for nine major groups of hay: Group I, Alfalfa and Alfalfa Mixed Hay; group II, Timothy and Clover Hay; group III, Prairie Hay; group IV, Johnson and Johnson Mixed Hay; group V, Grain, Wild Oat, Vetch, and Grain Mixed Hay; group VI, Lespedeza and Lespedeza Mixed Hay; group VII, Soybean and Soybean Mixed Hay; group VIII, Grass Hay; and group IX, Mixed Hay.

For the purposes of the standards, hay is confined to the harvested, unthreshed forage which has recognized feed value as determined by the United States Bureau of Agricultural Economics, which is specifically classified in each group, which is not coarse and woody, and which does not contain more than 35 percent of foreign material.

These groups, with the exception of Grass Hay and Mixed Hay, are based on the combinations of various kinds of hay commonly found in association in the chief areas of production and the chief markets of the United States. Timothy and clover hays, for example, belong in one group because such kinds of hay are grown in quantity in the same geographic regions and often in mixtures with each other. The groups Alfalfa and Alfalfa Mixed Hay; Prairie Hay; Johnson and Johnson Mixed Hay; Grain, Wild Oat, Vetch, and Grain Mixed Hay; Lespedeza and Lespedeza Mixed Hay; and Soybean and Soybean Mixed Hay are founded on similar conditions and facts.

Group VIII, Grass Hay, is hay in which the grasses other than timothy, Johnson grass, upland and midland prairie grasses, grain cut for hay, millet, or Sudan grass strongly predominate, thus giving the hay a grassy appearance.

Grass Hay comprises hay containing over 60 percent, either singly or in combination, of the miscellaneous cultivated grasses such as redtop, bluegrass, Bermuda grass, quackgrass, and cheat, or the uncultivated grasses, sedges, and rushes of virgin meadows which have recognized feed value other than the recognized upland and midland prairie grasses of the hay trade. In a limited way, and in nearly all hay-producing regions, these miscellaneous grasses are made into hay and are baled and shipped to hay markets. Few, if any of them, justify specific classification. Hay containing over 60 percent of these miscellaneous grasses is all distinctly "grassy" in appearance and, with but few exceptions, not in as great demand as timothy, clover, alfalfa, or upland prairie hay. For these reasons all these miscellaneous grasses are classified as "Grass Hay" in the official standards.

Group IX, Mixed Hay, comprises combinations of various kinds of hay that are not as definitely recognized in hay-marketing practices as the combinations specified in the various classes of hay in groups I to VIII, inclusive. Mixed Hay is hay that is not specifically classified in the official standards but which contains 50 percent or more, singly or in combination, of alfalfa, timothy, clover, upland, and midland prairie grasses, Johnson grass, grain hay, vetch hay, lespedeza, soybean hay, or other grasses as defined in United States standards. Thus hay mixtures containing over 50 percent of Sudan grass, cane hay, peanut hay, or some other kind of hay for which there are no United States standards, are not included in Mixed Hay. Such hay mixtures are either described on Federal hay certificates or graded under other standards than United States standards.

One set of definitions is provided in the official hay standards which are applicable to all groups of hay. All terms used in the class and grade requirements must be interpreted according to these definitions. Each of the groups, however, has its classes and grades.

Hay Classes

In the official hay standards of the United States the term "class" is used to describe the kind of hay or the mixtures of various kinds, and has no reference whatever to quality or condition. Class names, such as Timothy, Clover, Alfalfa, Timothy Light Clover Mixed, Alfalfa Light Grass Mixed, Alfalfa Heavy Johnson Mixed, etc., are as descriptive of the kinds and mixtures of hay as necessary terseness will permit. The first word in each class name usually indicates the kind of hay which predominates in that class. Succeeding words, if any, in the class names, indicate the kind of hay mixed with the predominating kind and whether the mixture is comparatively light or in an amount too great to be considered as a light mixture.

The following examples will serve to illustrate the descriptive character of the class names. The class name Timothy implies straight or pure timothy and such is the case except for the small percentages or tolerances of grasses and clovers that are allowed in the class to meet the practical conditions of timothy production. The class name Timothy Light Clover Mixed plainly describes a hay mixture in which the timothy predominates and in which the clover portion is of minor importance. Similarly, the class name Clover Light Timothy Mixed describes a hay mixture in which clover predominates and in which timothy is of minor importance. The class name Timothy Medium Clover Mixed describes a hay mixture of two principal kinds, each kind being present in quantities too great for either of the light mixtures. The same methods are followed in the class names for the groups Alfalfa and Alfalfa Mixed Hay; Johnson and Johnson Mixed Hay; Prairie Hay; Grain, Wild Oat, Vetch, and Grain Mixed Hay; Lespedeza and Lespedeza Mixed Hay; and Soybean and Soybean Mixed Hay.

Each class of hay in the official standards is based upon definite specifications for the mixtures permitted. The class specifications must be interpreted through the definitions in order to fully understand the class requirements. For example, the words "timothy, clover, grasses, alfalfa", etc., appear constantly in the class specifications and for the purposes of these standards these words are accurately defined under the definitions.

Under ordinary conditions of hay production miscellaneous grasses or legumes are sometimes present in such small quantities as not to be considered of sufficient importance to be included in the class name. Such minor mixtures or tolerances (ordinarily not more than 10 percent of the total hay of each kind), are covered either in the definitions where they are comparable to the kind of grass or legume defined or in the mixture percentages prescribed for each class under the class requirements. For example, in the definitions it is stated that timothy may include not to exceed 10 percent (of the total hay) of other grasses; that clover may include 10 percent of other legumes; that alfalfa may include 10 percent of other legumes; and that grasses shall be redtop, bluegrass, and certain other grasses. Thus when the class specifications are interpreted through the definitions it is understood, where not stated in the specifications, that timothy may contain 10 percent of bluegrass and/or other grasses; that clover may contain 10 percent of vetches and/or other forage legumes; or that alfalfa may contain 10 percent of clover and/or other forage legumes; and that the 10 percent allowance of a different kind of hay is considered as a part of the kind of hay named as a class constituent.

The various classes of hay in United States standards have been designed to include the well-defined kinds and mixtures of hay that are of chief commercial importance in the United States. The great majority of hay markets and

shipping points, considered separately, can make use of but a few of these hay classes because a class of hay such as Alfalfa Light Johnson Mixed, common in the South Atlantic States, is unknown in the Middle Western States, or Alfalfa Light Grain Mixed, common in the Pacific Coast States, is unknown in the North Atlantic States. The hay classes in United States standards are national in scope and each market or producing region will use such classes as are of local importance.

Hay Grades

Numerical grade and Sample grade.—In the official hay standards the term “grade” is used to describe the quality of hay. The quality varies in all classes of hay according to the conditions under which the hay was produced. Each class of hay is divided into three numerical grades, namely: U. S. No. 1, U. S. No. 2, and U. S. No. 3, each such grade having different quality requirements. In all classes there is a Sample grade for inferior hay not good enough for the numerical grades.

In the Alfalfa and Alfalfa Mixed Hay, Lespedeza and Lespedeza Mixed Hay, and Soybean and Soybean Mixed Hay standards, the grading factors are leafiness, color, and foreign material, in the order of importance. In the Timothy and Clover Hay, Johnson and Johnson Mixed Hay, Prairie Hay, and Grass Hay standards, color is the most important grading factor, with foreign material a grading factor of secondary importance. In Grain, Wild Oat, Vetch, and Grain Mixed Hay maturity, color, and foreign material are the grading factors, of which maturity is the most important.

The quality and condition of the greater part of the hay crop of the United States are covered by the numerical grades and Sample grade. In the official standards they are supplemented with special grades to describe and emphasize certain superior or inferior qualities not covered by the numerical grades and Sample grade.

Special grades to supplement the numerical grades and Sample grade.—United States hay standards recognize the fact that such characters as exceptional leafiness in alfalfa hay; exceptional color in all kinds of hay, except grain hay; stemminess in clover hay; fine texture in Johnson hay; and coarseness in alfalfa, Johnson, grain, and soybean hays affect palatability and feed value and thus create price differentials from the average of the common run of hay. These unusual characters must be described in some specific manner in the inspection and grading of hay, otherwise wide spreads of value and price would occur occasionally in the same grade.

This problem of describing and emphasizing certain superior or inferior characters of hay is met in the official standards by the use of special grades entitled "Grades for extra green hay", "Grades for green hay", "Grades for extra leafy hay", "Grades for leafy hay", "Grades for coarse hay", "Grades for stemmy hay", and "Grades for fine Johnson hay" which appear in paragraph form after the tabulated standards for each group. These special grades are so arranged that the designation for the special grade is included with the numerical or Sample grade and make a part of the complete grade designation. The following paragraphs discuss some of the special grades and illustrate their application.

It is a well-known fact that approximately two-thirds of the protein of the alfalfa plant is contained in the leaves and because of this fact purchasers of dairy alfalfa usually demand hay which is leafy in character. U. S. No. 1 Alfalfa must be hay which meets No. 1 grade requirements for all three of the factors, leafiness, color, and foreign material. If alfalfa hay is exceptionally leafy (50 percent or more), or leafy enough for the No. 1 grade (40 percent or more) but deficient in one of the other grading factors, special grades are used to portray these leafy qualities. For example, a lot of hay classed as Alfalfa which meets the requirements of the No. 1 grade,

and in addition thereto has an exceptional amount of leaves, most of which are clinging to the stems, is graded U. S. No. 1 Extra Leafy Alfalfa instead of U. S. No. 1 Alfalfa, which latter designation would apply in case no special grades were available for extra leafy hay. For another example, a lot of hay which has the leafiness quality of No. 1 but is No. 2 because of color would be graded U. S. No. 2 Leafy Alfalfa instead of U. S. No. 2 Alfalfa, which latter grade designation would apply in case no special grades were available for leafy hay.

Under certain conditions hay that is exceptionally green or that has enough color for the No. 1 grade but is otherwise deficient in No. 1 grade quality is considered superior hay by the trade because of its color. The special grades "Extra Green" and "Green" are used to portray the superior quality of such hay according to the indicated factor of color. For example, a lot of hay classed as Timothy, which meets all the requirements of the No. 1 grade and in addition thereto has an exceptional amount of green color, is graded U. S. No. 1 Extra Green Timothy. For another example, a lot of hay which has the color quality of No. 1 but is No. 2 because of foreign material, would be graded U. S. No. 2 Green Timothy.

The special grades in United States standards are to be considered as terse descriptions of the superior or inferior characters in hay which may be employed when necessary to supplement the numerical or Sample grade description and to differentiate such hay from the common run of hay that is described by the numerical or Sample grade designations.

Prescribed Remarks to Supplement Grade Designations

Ordinarily the grade designation is the only written evidence of the kind and quality of the hay which appears on a Federal certificate.

The full meaning of the grade designation must be determined from the standards and the definitions accompanying the standards. Certain important exceptions are provided for, however, where explanatory remarks are considered valuable to show the reasons why a certain grade was assigned, or in some instances to provide information that supplements the grade designation. For these purposes remarks are prescribed which appear on Federal certificates with reference to special explanations for certain numerical grades and Sample grade.

Numerical grade and Sample grade remarks.— In the application of the official standards, there are four cases when inspectors are required to supplement the grade designation with a remark of an explanatory character on the certificate to explain the grade assigned to a lot of hay.

(1) Whenever hay of group II—Timothy and Clover Hay, group III—Prairie Hay, and group VIII—Grass Hay, is graded No. 3 because of stain.

(2) Whenever hay of the Group Alfalfa and Alfalfa Mixed Hay is graded No. 2 because a majority of the alfalfa stalks bear brown and/or black seed pods.

(3) Whenever hay of the class Upland Prairie of the Group Prairie Hay is graded one grade lower than it would be graded on the factor of color because more than one-third of the upland grass stalks bear seed heads and/or jointed stems.

(4) Whenever hay of any group is graded Sample grade.

Thus, whenever a statement under Remarks appears in the certificate in conjunction with a grade designation it indicates that the hay would be entitled to a higher grade but for the exceptional factor referred to in the remark statement.

Optional Descriptive Information

Other pertinent facts of a descriptive nature about the quality and condition of hay may be placed on Federal certificates at the request of

the applicant or at the discretion of the inspector when market practices warrant. These optional remarks are intended to cover cases where the applicant wants the certificate to carry such statements as a description of the kind of clover in the mixture, the character of the foreign material, the character of the damage, the condition of alfalfa stems, or other statements of a similar nature that are facts. Occasionally also the inspector may find cases where his judgment dictates the use of remarks to describe unusual facts about a lot of hay, such as a description of the sweated condition of hay, the crushed stems of alfalfa due to machines used to hasten curing, or other facts of a similar nature which he considers valuable and that are pertinent.

Definitions

The definitions in the standards provide full explanations for all terms and words of significance in the class and grade specifications. The standards contain many terse terms and many key words that require precise definition to be fully understood, such as "percent green color", "foreign material", "injurious foreign material", "timothy", "clover", "alfalfa", "Johnson grass", "upland grasses", "midland grasses", "grasses", "grain hay", and "legumes." Some of the definitions have exception clauses in them in order to make them equally applicable to all classes of hay.

One illustration based upon the grade designation U. S. No. 2 Coarse Alfalfa will serve to show the use of the definitions in the interpretation of the grade designation. The class requirements for the class Alfalfa involve an interpretation of the words alfalfa and grasses. These words, as used in the Alfalfa and Alfalfa Mixed Hay standards, are explained under definitions. The word alfalfa for example, is defined so as to include 10 percent of other

legumes. The grade requirements of leafiness, color, and foreign material for the No. 2 grade are explained and defined in the definitions under the paragraphs entitled "Percentages", "Green color", and "Foreign material." The special grade "Coarse" which has been included with the numerical grade in the complete grade designation is based upon a definite standard for coarseness. This standard is included as a part of the definition for "Grades for coarse hay" in group I and is defined as follows: Hay in which the alfalfa stalks are hard and round and more than 30 percent of the alfalfa stalks have diameters equal to and greater than the diameter of no. 11 steel wire.

Any grade designation in the hay standards may be interpreted in a similar manner.

IMPORTANT FEATURES OF OFFICIAL STRAW STANDARDS

The official standards of the United States for straw comprise standards for five different kinds of grain straw; that is, wheat straw, oat straw, barley straw, rye straw, and rice straw. The remnants of other crops from which the seed has been threshed, such as threshed timothy and threshed alfalfa, are not included in and cannot be graded under these standards.

These standards provide two numerical grades and a Sample grade for each kind of straw. Two numerical grades are considered sufficient because the range of quality is not so great in straw as it is in hay and the commodity has a rather low intrinsic value. Sample grade includes the inferior types of straw that are not good enough for the numerical grades.

Special grades are provided to cover the exceptional quality factors of straight and untangled rye straw and of excessive chaffiness in all straws. The special grades for "straight rye straw" are provided to designate rye straw that was threshed in such a manner that the straws were not broken or tangled and that was pressed into box-pressed bales wherein it retained its straight and untangled condition. The special grades for "long rye straw" are provided for a similar type of rye straw that has been pressed into perpetual-pressed bales. These types of straw are preferred for certain uses and often are sold for a premium over the tangled rye straw.

The special grades for "chaffy straw" are provided for all kinds of straw that have been threshed in such a manner that the chaff and broken pieces of straw (4 inches or less) amount to more than 35 percent of the total weight. This kind of straw is produced usually when the

modern type of thresher with self-feeder and blower stacker is used. Chaffy straw is very desirable for use as litter for poultry but is objectionable for use in stables that have underground drainage because the chaff will collect in and clog the traps. Another objection to this kind of straw is that it cannot be salvaged in the stalls and used a second time for bedding as well as long straw, because the straw is too short to be separated from the manure with the ordinary stable fork.

The definitions accompanying the straw standards provide full explanations for all terms and words of significance in the class and grade specifications and may be interpreted in the same manner as in the hay standards.

IMPORTANT FEATURES OF FEDERAL HAY INSPECTION

Federal hay inspection is authorized by a clause in the annual appropriation acts for the Department of Agriculture. In the appropriation act of May 17, 1935 (49 Stat. 247), this clause reads as follows:

“For enabling the Secretary of Agriculture, independently and in cooperation with other branches of the Government, State agencies, purchasing and consuming organizations, boards of trade, chambers of commerce, or other associations of business men or trade organizations, and persons or corporations engaged in the production, transportation, marketing, and distribution of farm and food products, whether operating in one or more jurisdictions, to investigate and certify to shippers and other interested parties the class, quality, and condition of cotton, tobacco, fruits, and vegetables whether raw, dried, or canned, poultry, butter, hay, and other perishable farm products when offered for interstate shipment or when received at such important central markets as the Secretary of Agriculture may from time to time designate, or at points which may be conveniently reached therefrom, under such rules and regulations as he may prescribe, including payment of such fees as will be reasonable and as nearly as may be to cover the cost for the service rendered: *Provided*, That certificates issued by the authorized agents of the Department shall be received in all courts of the United States as prima facie evidence of the truth of the statements therein contained.”

Organization of Federal Hay Inspection Service

A Federal hay inspection service is conducted by the Hay, Feed, and Seed Division of the Bureau of Agricultural Economics under the

authority quoted in the preceding paragraph. The general plan of this service provides for the employment of Federal hay inspectors at important central markets and at shipping points under cooperative agreements between the Bureau of Agricultural Economics and organizations such as State departments of agriculture, commercial exchanges, and dealers' or growers' associations.

The Bureau of Agricultural Economics trains the inspectors employed under these agreements in the use of the official hay standards of the United States and in the department's methods of inspecting hay. After the inspectors complete this training satisfactorily they are licensed as Federal hay inspectors and the Bureau supervises their work during the life of the license. The organization cooperating with the Bureau pays the inspector for his work and pays all other local expenses, such as office rent, necessary to the proper conduct of the work.

The organization cooperating with the Bureau usually collects the fees charged for inspections made under agreements of this kind. The funds obtained in this way are divided between the local organization and the United States Department of Agriculture in such a manner that both are recompensed as nearly as possible for the expense incurred by them in the conduct of the service.

The work of the local inspectors is supervised by Department hay standardization specialists and supervising inspectors located at central points in the large hay producing and consuming areas. The supervising inspectors not only assist in supervising the work of the local inspectors but also are available to make inspections at points in their territory where no other inspectors can be obtained and to assist producers, dealers, and consumers in obtaining all benefit possible from the Federal hay standards and hay inspection service.

Federal-State Hay Inspection

In many States the hay-inspection service is established by the United States Department of Agriculture in cooperation with some State agency such as the State department of agriculture or State market commission.

Federal-State hay inspectors operating under such arrangements are trained and licensed by the United States Department of Agriculture and function in the same way as Federal inspectors. In most cases these inspectors are either employees of the State department or are licensed by it. Federal-State certificates issued by these inspectors are supported by the authority of the State as well as the Federal Government and in most cases are prima facie evidence of the facts contained in State courts as well as in Federal courts.

In several of these States the use of United States standards is compulsory for all transactions involving hay unless the hay is especially marked or described as "not graded." Some of these States also prohibit any person from certifying to the grade of hay unless he is either an inspector licensed by the State or a State employee designated as an inspector.

Location of Inspectors and Designation of Markets

Federal hay inspectors and Federal-State hay inspectors are located at all points where arrangements for their employment can be made with some suitable organization under one of the plans previously outlined. Wherever there is sufficient demand for inspection to pay the expense of having an inspector but no suitable organization is prepared to cooperate with the Bureau, an inspector may be located at that place who is a full-time Government employee or arrangements may be made to supply the service in any other manner that may appear desirable.

Distributing and consuming markets at which inspectors are located are designated by the Secretary of Agriculture as important central markets for the inspection of hay. The inspectors located at such markets also will inspect hay received at all points within a reasonable distance of these markets insofar as they have time for work of that kind. Inspectors located in producing areas usually are available for inspection of hay at any point near their headquarters.

Persons interested in having a hay inspector located at any place should write the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C. Communications of this sort should outline as fully as possible the situation at the point where inspection is desired, including the name of any State or local organization with whom the Bureau might cooperate in establishing the service, the probable number and kind of inspections that such an inspector would make annually, and the fee that might be charged for each inspection.

Qualifications of Inspectors

All Federal hay inspectors must complete satisfactorily a course of training provided by the Bureau of Agricultural Economics before being designated or licensed as inspectors. The training course usually covers a period of 2 to 3 weeks. Men admitted to these training schools are required to have at least a common-school education and to have had either sufficient experience in handling and marketing hay or college training along agricultural lines to qualify them to grasp readily the principles on which the official hay standards are based. In other words, the schools are for the purpose of training men already familiar with hay to apply properly the official standards and not for the purpose of making hay inspectors of men who know nothing about hay.

Each candidate for an inspector's license is required to satisfactorily pass a color test prescribed by the Bureau of Agricultural Economics. A person having any indication of color blindness cannot become a competent hay inspector.

Inspectors' Training Schools

The schools for training inspectors are held at the hay-standardization laboratories of the Bureau in Washington and Kansas City, and at other points where needed. There is no regular time for these schools but they are held whenever a sufficient number of persons require training. After inspectors are first designated or licensed they are brought together at central points in different sections from time to time for additional training and discussion of problems relating to their work. Such meetings usually last from 3 days to a week and are of material aid in keeping the work of the inspectors uniform at all times.

Federal Hay-Inspection Certificates

Regulations of the Secretary of Agriculture governing the inspection of hay require each inspector to issue an inspection certificate for each lot of hay inspected by him. The law provides that all such certificates are receivable in all courts of the United States as prima facie evidence of the truth of the statements they contain. A number of the States also have laws making all Federal certificates, as well as State certificates, acceptable as prima facie evidence in their State courts.

Kinds of Inspection Available

To take care of various conditions existing in the hay trade it has been necessary to provide several forms of inspection known as partial inspections, complete inspections, sample inspections, and appeal inspections.

Partial inspections are made when not enough of the hay in the lot is seen to permit the inspector to make a complete inspection. For example, a car-door inspection is a partial inspection. In such cases the inspector issues a partial-inspection certificate. The words "Partial Inspection" are printed on this certificate in large type. The certificate states the part of the lot examined by the hay inspector and the quality and condition only of the part actually seen.

Additional partial inspections may be obtained when a complete inspection cannot be made but when a statement is desired about the quality and condition of a different portion of the lot or of the same portion of the lot covered by previous partial inspections, or for the purpose of ascertaining whether there has been any change in the quality or condition of the hay since the previous inspection, or for the purpose of obtaining an up-to-date certificate. As many inspections, either partial or complete, may be obtained at the same or any other place, as the applicant may desire. Certificates issued on such additional partial inspections not only state the portion of the lot examined by the inspector and the quality and condition thereof, but also the results of all previous inspections at the same place.

Complete inspections are made only when the inspector either sees every bale in the lot or a sufficiently representative portion of the lot to permit him to determine the quality and condition of the entire lot. In such cases the inspector issues a complete inspection certificate which gives a statement of the quality and condition of all hay in the lot without any qualifications. The words "Complete Inspection" are printed in large type on this form of certificate. Complete inspection usually can be made on hay that is being loaded into or unloaded from cars or that is stored in public warehouses in piles of not more than 10 or 12 tons each. It also can be used for what is commonly known as plug inspection of car lots, providing the plug removed from

the carload is of sufficient size and is taken from the center back to each end.

Complete inspections may be original inspections or may follow one or more partial inspections of the same lot. When a complete inspection follows a partial inspection, all of the hay in the lot covered by previous partial inspections at the same place, together with the remainder of the lot not previously inspected, must be available for the complete inspection.

As many complete inspections may be obtained at the same or any other place as applicants may desire. Ordinarily when additional complete inspections are wanted on the same lot of hay they are for the purpose of ascertaining whether there has been any change in the quality and/or condition of the hay since the previous inspection, or for the purpose of obtaining up-to-date certificates. Certificates issued on such additional inspections always give the results of all previous inspections at the same place.

Sample inspections are inspections of single bales or smaller portions delivered to the inspector's office. This provides means for learning the grade of a lot which is located too far from the inspector's office to permit the expense of having an inspector examine the hay personally. Sample inspection certificates show the size of the sample examined by the inspector and state that the quality and condition shown is that of the sample only. The value of a certificate of this kind depends largely on whether the sample is truly representative of the lot from which it was taken. If a controversy is to be settled by means of a sample inspection, all interested parties should agree upon a representative sample for this purpose before sending it to the inspector. Samples for inspection should weigh not less than 10 pounds and should be in such physical condition as to permit the inspector to determine all factors affecting their quality and condition. The following form is suggested for use in submitting agreed samples:

TO THE OFFICE OF FEDERAL HAY INSPECTION:

We agree that the accompanying sample is a representative sample taken on -----, 193--, from a lot of hay identified and then located as follows: -----

Car number or other identification of hay

and hereby request that it be inspected and certified by a Federal hay inspector.

Place -----

Date -----

Shipper or his representative

Address

Receiver or his representative

Address

Appeal inspections can follow only complete inspections or sample inspections. An appeal inspection involves a question of the accuracy of the inspection from which the appeal was taken, and can be made only provided the hay has not left the place where the inspection was made, the condition of the hay has not undergone a material change, the identity of the hay has not been lost, and the application is filed before the close of the second business day following the original inspection from which the appeal is requested. Therefore an appeal inspection is never made by the inspector who made the inspection on which the appeal was taken but by an inspector designated specifically for the purpose by the Chief of the Bureau of Agricultural Economics. An appeal inspection certificate gives a clear statement of the quality and condition of all hay in the lot and refers specifically to all previous inspections superseded by it.

No appeal may be taken from an inspection made at any other place, but a new complete inspection of the same lot may be obtained and an appeal may then be taken from such inspection upon compliance with the regulations of the Secretary of Agriculture.

Who Receives Certificates

The original and one copy of any form of Federal hay-inspection certificate are always delivered to the person who made application for the inspection. Upon request, copies of the original inspection certificate are furnished to other financially interested persons, which includes interested carriers and public warehouses, for a nominal fee. Copies of inspection certificates which include the results of previous inspections and copies of appeal inspection certificates are sent to all interested parties, if known, and to such carriers as have been applicants for previous inspections.

Standards Used in Making Federal Inspections

The law establishing Federal hay inspection authorizes the Secretary of Agriculture to certify the quality and condition of hay, but the law does not specify the manner in which the quality and condition shall be stated. Federal hay inspectors, however, are required to use the United States standards for all kinds of hay for which such standards have been established. In addition, certificates must show any other facts (such as poor baling), which affect the value of hay but are not covered by the standards. For hay and straw to which official standards do not apply inspectors are instructed to describe the quality and condition of the hay or straw as nearly as possible.

What Federal Inspection Certificates Show

All Federal inspection certificates show the date on which the inspection was made and the quantity of hay in the lot inspected together with the identification and location of the hay at the time of inspection. Partial-inspection certificates also show the portion of the lot actually examined by the inspector.

Following these items all certificates show the class and grade of all the hay examined according to the United States standards whenever these standards apply.

Notations about factors affecting the grade may follow the class and grade as already explained in the description of the standards. If there is more than one class or grade of hay in the lot the quantity of each class and grade seen by the inspector is stated separately, the largest quantity being named first.

Statements about other conditions affecting the value of the hay but which do not affect the class or grade are placed below the class and grade. These include poor baling, defects in cars in which the hay is loaded, and similar information.

Fees and Charges

The Secretary of Agriculture authorizes certain fees and charges to be collected for the work of Federal inspectors. These vary somewhat at different points depending on the volume of business at that point, the accessibility of localities where inspections ordinarily are made, and other factors.

The fees are the amounts charged for the actual work of making inspections and appeal inspections. The charges cover amounts that inspectors are permitted to charge for their time and travel expenses when making inspections at points away from the regular stations. Schedules of fees and charges at any point where inspectors are located can be obtained upon application to the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

How to Obtain Inspection

Any person having a financial interest in a lot of hay who desires to obtain inspection of the lot should make application for inspection to any Federal hay inspector or any Federal-State hay inspector. The application should give the necessary information to permit the inspector to determine whether the inspection can be made under the act authorizing the service and to locate the hay for the purpose of making the inspection. The applicant should arrange also with the inspector for payment of the necessary fees and charges. The inspector receiving the application will either arrange to make the inspection or have it made by some other inspector or advise the applicant why the inspection cannot be made.

IMPORTANCE OF TIME OF CUTTING

To produce the top grades which have relatively high nutritive value and which command the highest market prices:

Alfalfa should be cut when one-tenth to one-fourth in bloom. In those areas in which alfalfa blooms sparingly because of seasonal conditions the growth of basal shoots and the general appearance of the field should serve as a guide for cutting. Alfalfa mixed hay should be cut when the alfalfa has arrived at the proper stage of maturity without regard to the other kinds of hay in the mixture.

Losses in leafiness occur and the stems become coarse and woody when alfalfa is allowed to pass beyond the full-bloom stage prior to cutting, thus lowering the grade and the feed and market value of the hay.

Timothy should be cut from the early- to the full-bloom stage. Maximum yields of protein per acre are obtained when the timothy is cut before full bloom. *Mixtures of timothy and such early-maturing grass as bluegrass* should be cut when the grasses are in full bloom and prior to the time when the grasses have lost their green color. *Grasses other than timothy and Johnson grass* should be cut not later than the full-bloom stage.

Clover should be cut at the half- to the full-bloom stage. Many of the leaves turn brown and wither and these leaves are often lost if the clover is allowed to stand beyond the full-bloom stage. *Mixtures of clover and timothy* should be cut when the clover is at the half- to full-bloom stage. The timothy will not have reached the full-bloom stage at this time unless the mixture consists of timothy and mammoth red clover.

Prairie grasses should be cut before the plants begin to turn brown from dry weather or maturity. Prairie grasses such as bluestem are likely to have jointed stems and seed heads at maturity and when cut in this condition the hay cannot meet the specifications for high-grade Upland Prairie.

Johnson grass should be cut when the heads have started to emerge from the boot, or not later than when one-fourth of the heads have emerged. There will be fewer viable seed in the heads of the earlier-cut hay. When Johnson grass is cut after the heads have fully emerged the hay is of lower grade and market value because of the coarse and woody stems, or because of insufficient green color.

Johnson grass should be cut prior to, or not later than, the forming of the heads in the boot if it is to meet the color and texture requirements of the grade U. S. No. 1 Extra Green Fine Johnson.

Grain and vetch should be cut for hay so as to meet the maturity specifications for these kinds of hay given under grade requirements for the group Grain, Wild Oat, Vetch, and Grain Mixed Hay.

Lespedeza hay should be cut before any of the lower leaves have turned brown, or before the seed is in the dough stage. Losses in leafiness occur when lespedeza is allowed to stand beyond the full-bloom stage prior to cutting. For the highest quality lespedeza hay the lespedeza should be cut as soon as it has made sufficient growth to be harvested.

Lespedeza that is allowed to ripen sufficient seed to reseed itself before being cut for hay will lose its leaves and therefore will not make hay of high quality. The practice of cutting just after a frost which causes the seed to fall also tends to make an inferior hay.

Soybean hay should be cut before the seeds are three-fourths developed. If the cutting is delayed beyond this time the stems become hard and woody and many of the leaves will have fallen, thus decreasing the palatability and feeding value of the hay. After the seeds are about half developed the lower leaves will begin to fall but the increase in the weight of the seeds will about compensate for the leaf loss in total digestible nutrients. Therefore, hay cut when the seeds are three-fourths developed will still have about the same feeding value.

IMPORTANCE OF GOOD BALING

Poorly baled hay includes principally bales that are ragged, bales having wires of unequal tension, and bales of varying lengths. Hay that is poorly baled is discriminated against in hay markets because it is unsightly and difficult to handle. When hay is poorly baled a notation to that effect is made on Federal certificates.



